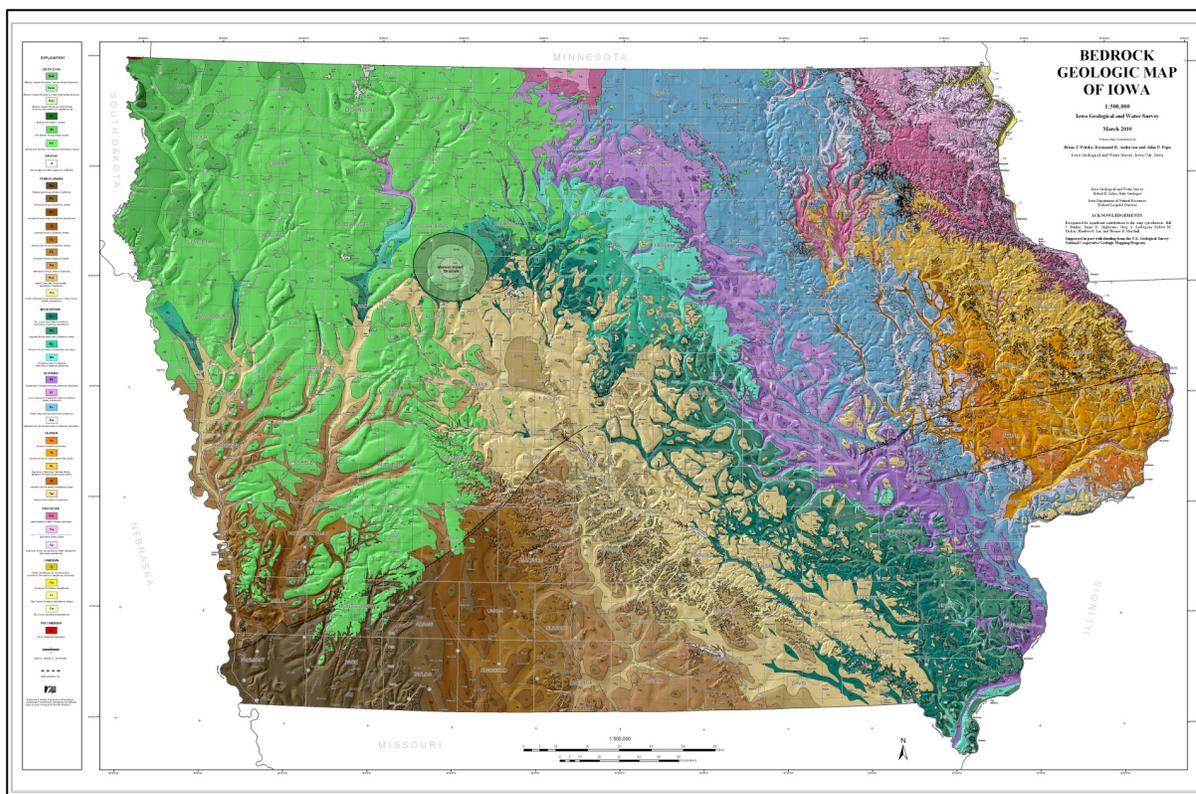


Annual Report Of the State Geologist



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Iowa Geological and Water Survey
Iowa Department of Natural Resources
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Iowa Geological and Water Survey

What we do: Since 1892, the Iowa Geological and Water Survey (IGWS) has provided earth, water, and mapping science to all Iowans. We collect and interpret information on subsurface geologic conditions, groundwater and surface water quantity and quality, and the natural and built features of our landscape. This information is critical for:

- Predicting the future availability of economic water supplies and mineral resources.
- Assuring proper function of waste disposal facilities.
- Delineation of geologic hazards that may jeopardize property and public safety.
- Assessing trends and providing protection of water quality and soil resources.
- Applied technical assistance for economic development and environmental stewardship.

Our goal: Providing the tools for good decision making to assure the long-term vitality of Iowa's communities, businesses, and quality of life.

Information and technical assistance are provided through web-based databases, comprehensive Geographic Information System (GIS) tools, predictive groundwater models, and watershed assessments and improvement grants. The key service we provide is direct assistance from our technical staff, working with Iowans to overcome real-world challenges.

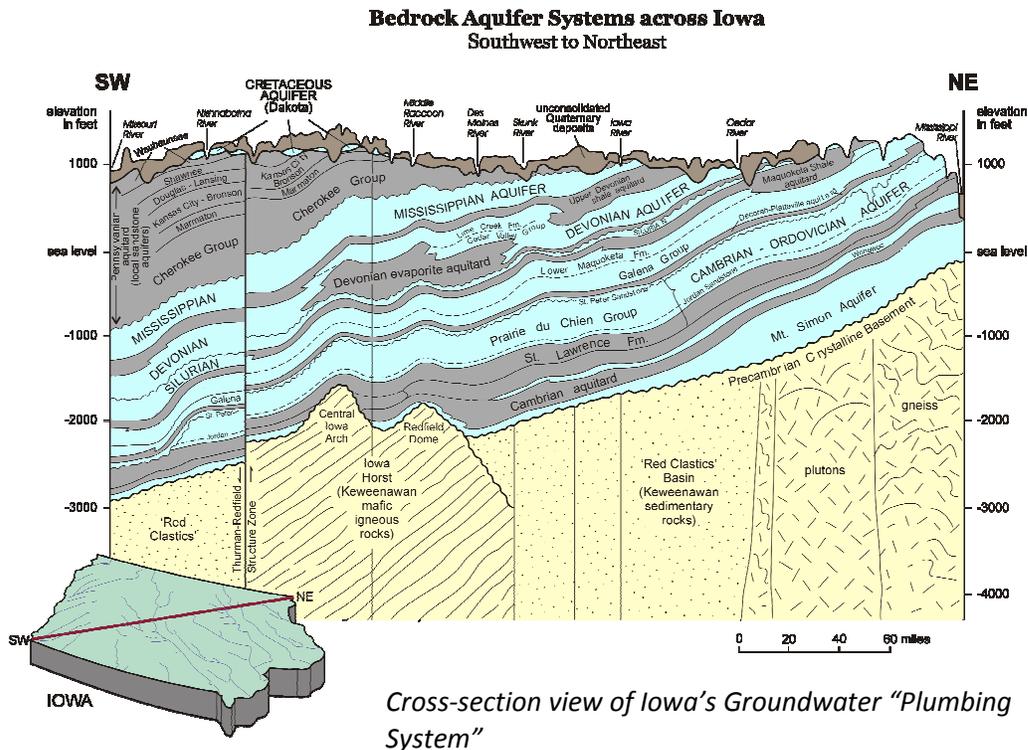
This report describes the basic functions of IGWS program areas, and highlights major activities and accomplishments during calendar year 2010. More information on IGWS is available at <http://www.igsb.uiowa.edu/>.

Geology and Groundwater

What we do: This program is responsible for the analysis of all parameters of geologic and hydrogeologic conditions, water resources budget relationships between supply and demand, economic mineral resources, geologic hazards, and defines the extent, recurrence interval, and impact of local and/or regional water development. Each year we answer several thousand phone requests for earth and water science information from within IDNR, other government agencies, businesses, and the general public. Our core functions include:

- Comprehensive mapping, data collection, and investigative programs are developed and implemented to enhance the state's geologic and water resources databases.

- Site specific and areal information services are provided to well contractors, engineering firms, municipalities, and the private sector for water supply development and management, mineral extraction, construction projects, hazard avoidance, and other aspects of resource management.
- Data review and interpretation are provided to DNR's Environmental Services Division to assist in regulatory decisions relative to water withdrawal permits, well-interference problems, waste disposal sites, and other permitted facilities.



Program accomplishments for 2010 include:

--Mapping the Earth's Resources

Geologic mapping of surficial deposits, the bedrock surface, and bedrock aquifers is a critical first step in providing resource evaluations to Iowans. During 2010, we completed the first regional-scale remapping of the state's bedrock surface since 1969, incorporating 40 years of new information and geologic interpretations. This effort also included mapping the elevation of the bedrock surface and the depth to bedrock. Products are available online, as GIS data layers and as paper products. This mapping is a major asset for forecasting water supplies, mineral deposits, hazardous conditions, and groundwater vulnerability.

We continued more detailed mapping of key parts of the state, with maps completed in Bremer and Worth counties, and ongoing mapping in Black Hawk, Scott, and Worth counties. Geologic mapping is guided by an advisory committee of public and private

interests, and is funded by 50-50 matching federal grants. Since 1993, we have received over \$2 million in federal funds, an amount exceeding two-thirds of the 45 states participating in the program.

Geologic maps are combined with related information that is tailored to our constituents needs. A particularly useful “applied” map produced in 2010 delineates areas where karst features such as sinkholes and losing streams are common, possible, or unlikely to occur. This map has been used by local watershed projects, planning departments, and road departments. Similarly, we have begun mapping areas where different types of geothermal heating/cooling systems are more economically feasible to install and use. This effort is funded by a grant from the U.S. Department of Energy and is designed to head off the construction problems that have been encountered by some users of this promising, rapidly growing renewable energy source. We are partnering with active interests in the City of Dubuque as this work begins.

--Source Water Protection for Iowans Drinking Water

The Source Water program provides public water supplies with information and technical assistance needed to protect their wells or surface water intakes from contamination. Iowa has over 1,900 public water supplies, serving most of the state’s population. The vast majority of Iowans use groundwater. Assuring the quality of these supplies is key for public health and for protecting the millions of dollars of water supply investments made by our communities.

Past records of well water quality are key to defining solutions to changes in quality. Last year we completed a groundwater-wellwater quality database with nearly 20,000 records from over 4,000 public wells across Iowa. The records in this database span over 100 years and track parameters ranging from hardness to nutrient levels to radioactive elements. The database is linked to GIS coverages, is web-available, and is used by water developers, businesses, and a variety of other interests.

Source water staff assisted many Iowa communities such as Guttenberg (Clayton Co.) and St. Ansgar (Mitchell Co.) in locating new wells away from known contaminants and others such as DeSoto (Dallas Co.) in protecting current wellfields through locally led volunteer efforts. These protection efforts are designed to make a long-term impact on natural drinking water quality and subsequently save the community money on water treatment or well replacement costs. Source Water staff have also worked on determining areas where water quality improvements might naturally occur, such as near river valley streambeds, and applying that knowledge to help communities maximize their local geologic setting for improving drinking water quality.

--Environmental Geology and Animal Feeding Operations (AFO)

IGWS staff provide geologic and environmental assessments and tools for the AFO program and for producers. These help assure compliance with regulations, allow producers to make informed choices about their operations, and provide the needed analysis for producers to take advantage of federal cost-share programs.

- IGWS staff assist producers and technical service providers with siting AFOs in locations that minimize environmental impacts through the interactive mapping web service, the AFO Siting Atlas, and by one-on-one consultation.
- IGWS staff consulted on 70 operations during 2010. These reviews are dependent on bedrock depth, soils data, well data, sinkhole location data, and other information sources that IGWS continuously update and improve.
- IGWS staff assist with construction permit reviews, well variance recommendations, and water monitoring for AFOs. IGWS staff have provided expertise in karst, hydrogeology, water quality, soils, well construction, mapping, data management, and many other topics which have been essential for informing science-based policies and regulations.
- Finally, IGWS staff have contributed significantly to the creation of a new AFO database which is publicly accessible and plays an important role in accurately assessing the impacts of animal feeding operations on water quality. Over 9,000 AFOs are tracked in this database.

Use of these animal numbers and facility locations have improved the ability of field staff to respond to spills, made it easier for producers to track their permits and maintain compliance, allowed watershed coordinators to identify candidates for voluntary improvements, and improved the accuracy of total maximum daily load (TMDL) assessments, which are the foundation of many watershed improvement programs.

--Water for Iowans - 2030 and Beyond

In 2008, IGWS staff began producing predictive models of our major groundwater aquifer systems to address long-term questions about “water quantity.” These models combine all available information on the geology, hydrology, and use of groundwater. Following rigorous testing, they can be used to predict how current or proposed groundwater withdrawals will affect other users and the sustainability of our groundwater supplies; how climate change or severe drought will impact our water; and what future water development scenarios will mean for the resource and users. As the full impacts of groundwater use decisions are not felt until well into the future, the models are a critical tool for sustainable water management for our communities, economy, and quality of life. In 2008, our work focused on the Dakota Sandstone, which underlies much of northwest Iowa, and in 2009 on the deep Jordan Aquifer, which underlies much of the state.

In 2010, predictive models were completed for the West Nishnabotna River aquifer in southwest Iowa and the Des Moines River alluvial aquifer between Emmetsburg and Graettinger (Palo Alto Co.). The West Nishnabotna model was divided into four local-scale models to better evaluate current and future water use permits near Manning, Harlan, Regional Water, and Oakland. The Des Moines River alluvial aquifer model was prepared to evaluate the new Iowa Lakes Regional Water well field north of

Emmetsburg, and its potential impact on approximately twenty-five irrigation wells. Various drought scenarios were used in the model to assure adequate water availability.

In addition to developing the new models, models and staff expertise provided localized assessments for water users in Marion (Linn Co.), Pella (Marion Co.), Fort Dodge (Webster Co.), Cherokee (Cherokee Co.), Storm Lake (Buena Vista Co.), and Emmetsburg (Palo Alto Co.), all areas where community and business interests in water are asking for assistance in assuring sustainable groundwater supplies into the future.

--Technical Assistance to Business

Many significant business undertakings require information and expertise on Iowa's subsurface conditions and resources. Several examples from 2010, beyond those related to groundwater development or mining, include:

The Iowa Stored Energy Park is a \$221 million project that uses low-cost, off-peak electricity and/or wind energy that is not being sold on the grid to compress and store air in an underground geologic structure of porous rock located 3,000 feet below the land surface. Air is stored for later use in making electricity. The project was initiated by the Iowa Association of Municipal Utilities and is the first of its kind in the world. The air storage facility requires a porous rock for air storage and an impermeable overlying cap rock unit to contain the air. Additionally, a dome-shaped structure is required to contain the compressed air. IGWS staff provided records and knowledge of Iowa's deep rock strata and structures, assisted in the delineation of the structure, and provided consultation on rock units during test well drilling. Such a structure was identified near the town of Dallas Center, in Dallas County. This was key to the project going forward, as the critical question from investors was "Will the rocks work?"

MidAmerican Energy's upgrade of high pressure gas lines through parts of Fort Dodge (Webster Co.) encountered areas where gypsum had been mined underground between 1895 and 1950. A search of IGWS files produced 27 maps, produced between 1927 and 1942, of 8 underground mines. Staff provided scanned images and worked with MidAmerican's consultants to help interpret the maps, their limitations, and the geology of the gypsum in that area. This allowed delineating the areas where undermining might be a threat to the high pressure pipelines and identified questionable areas where more information was needed. This work saved the company significant expense, prompting their consultants to say:

"...Very often the monetary value of the data and expertise provided for one project far exceeds the entire funding allotment for the Geological Survey."

Natural Gas Pipeline Co. (NGP) had sufficient concerns about repeated flooding along the Cedar River at its Columbus City (Louisa Co.) deep geologic gas storage facility to decide to close and re-drill two deep injection/recovery wells—an expensive proposition. These high-pressure gas wells require highly specialized procedures when drilled, constructed, and abandoned. These procedures are outside the realm of the Iowa Department of Natural Resources rules for typical wells and outside the experience

of essentially all Iowa certified well drillers. IGWS and other department staff worked with NGP to utilize Federal Energy Regulatory Commission standards to properly do the work while avoiding regulatory red tape on this multi-million dollar project.

Watershed Improvement

What we do: This section includes the Total Maximum Daily Load (TMDL) Program and the Nonpoint Source Program. These two programs together make up the core of DNR's Watershed Improvement Program. The overarching goal of this program is to work to



Watershed and lake restoration project at Lake Anita.

solve water quality problems which are causing Iowa's rivers, streams, and lakes to be listed on the Iowa Impaired Waters List.

The TMDL Program produces Water Quality Improvement Plans (WQIP) in accordance with the federal Clean Water Act. These WQIPs are designed to calculate the maximum daily pollutant loading capacity that can be assimilated by a water body and allocates that pollutant load among the various point and nonpoint sources for the pollutant in question. WQIPs are then used, in part, by DNR's NPDES Permitting Section to allocate pollutant discharge limits for

permitted point sources in accordance with DNR and U.S. Environmental Protection Agency (EPA) regulations and the Clean Water Act. WQIPs are also used to guide planning by local watershed groups interested in reducing pollutant loads coming from nonpoint sources through the development of a comprehensive Watershed Management Plan.

The Nonpoint Source Program manages the EPA Section 319 Nonpoint Source Program for the State of Iowa, in accordance with the requirements of the federal Clean Water Act. The Nonpoint Source Program implements the EPA Section 319 Program by helping local watershed groups develop comprehensive Watershed Management Plans (WMP) through a variety of technical assistance and financial assistance programs. Once these WMPs have been developed and approved by EPA, the Nonpoint Source Program then offers additional technical and financial assistance to local watershed groups to implement the strategies outlined in the approved WMP. The overarching goal of these WMPs is to implement watershed improvement strategies needed to remove water bodies from the Iowa Impaired Waters List.

Program accomplishments for 2010 include:

--TMDLs – Targets for Water Quality Goals

The TMDL program prepared Water Quality Improvement Plans (WQIP), also known as total maximum daily loads (TMDL) for six water bodies in 2010. These included Duck Creek in Scott County (bacteria); Black Hawk Lake in Sac County (algae, turbidity); Silver Creek in Clayton County (sediment, ammonia); Dry Run Creek in Black Hawk County (biological due to runoff from continuous impervious surfaces); Lake of Three Fires in Taylor County (bacteria); and Big Creek Lake in Polk County (bacteria). In addition, the TMDL program completed its responsibilities for fulfilling the Consent Decree issued by the federal District Court at the beginning of 2010. Staff also developed watershed/water quality models to support local watershed planning efforts in Rapid Creek in Johnson County and Price Creek in Iowa County. Finally, the program conducted water quality monitoring in a number of water bodies in preparation for future WQIP development scheduled for the next two years.

--Green Urban Stormwater Projects

The Watershed Improvement Section awarded \$1.425 million of I-JOBS Infrastructure funds to 17 Iowa communities, businesses, and schools to help them improve urban water quality and create jobs. The grants helped Iowa organizations design and build projects that benefit water quality and reduce runoff from urban stormwater. The I-JOBS funds were matched by almost \$7 million in local funds. Urban green stormwater practices, such as bioswales, rain gardens, and permeable pavement, help slow and filter rainwater as it runs off urban surfaces. As it runs across lawns and pavement, stormwater can pick up pollutants like soil, fertilizers, pet waste, and oil. Rainwater washes into storm sewers, which dump the water into a local stream or lake without any treatment.

--Nonpoint Source Pollution Projects

In 2010, the Nonpoint Source (NPS) Program awarded nearly \$2.07 million in EPA Section 319 nonpoint source grant funds to six new and ongoing watershed improvement projects designed to improve water quality throughout the state. These watersheds included Tete des Mort Creek (Jackson Co.), Dry Run Creek (Black Hawk Co.), Lake Geode (Henry Co.), Lyons Creek (Hamilton Co.), Carter Lake (Pottawattamie Co.), and Lake Rathbun (Appanoose Co.). In addition, the NPS Program provided funding to support the development of a statewide small open feedlot strategy; continued support for the Iowa Learning Farms project based in the Leopold Center at Iowa State University; provided funding support for two years to Iowa State University to develop community assessment tools and training to help local watershed groups effectively engage their watershed community in local capacity building for improving water quality; and funded a six-year initiative to conduct a comprehensive statewide survey of freshwater mussel species in Iowa streams and rivers. Total funds for these projects exceeded \$480,000. The NPS Program also awarded Watershed Planning grants totaling nearly \$230,000 to six local watershed groups, including Black Hawk Lake (Sac Co.), Storm Lake (Buena Vista Co.), Swan Lake (Carroll Co.), Badger Creek Lake (Madison Co.), Silver Creek (Howard Co.), and Yellow River headwaters (Winneshiek Co.).

--Basin Approach to Improving Water Quality

In 2008, the Watershed Improvement Program initiated a discussion within its core partnership (DNR, Iowa Department of Agriculture and Land Stewardship – Division of Soil Conservation, Natural Resources Conservation Service, and the local Soil and Water Conservation Districts) to explore rethinking and reshaping the approach used to deploy staff resources to more effectively support efforts to improve watershed management and improve water quality throughout the State of Iowa. As a result of these discussions, in 2010 the Watershed Improvement Program expanded the network of Basin Coordinators from three to five staff members with the addition of a Basin Coordinator to serve the Upper Des Moines/Raccoon River Basin and another to serve the Iowa/Cedar River Basin. Long-range plans, subject to available funds, are to continue to expand this network to a total of nine Basin Coordinators covering the six major drainage basins and three major river regions within the state of Iowa. The addition of the Upper Des Moines/Raccoon River Basin Coordinator helped secure nearly \$9.3 million in USDA Upper Mississippi River Basin Healthy Watershed Initiative funds for this basin to help landowners avoid, control, and trap nutrients from entering Iowa's waterways. The recently added Iowa/Cedar River Basin Coordinator is positioned to actively support the U.S. Army Corps of Engineers Iowa River Basin Interagency Coordinating Team (IRBIACT), as well as the newly formed, grassroots Cedar River Watershed Coalition. The IRBIACT, led by the Corps of Engineers, is working toward preparing a Watershed Plan for the entire Iowa/Cedar River Basin over the next two years.

Geographic Information Systems

What we do: Geographic Information Systems (GIS) are powerful tools for integrated mapping and analysis of the state and its regions. The GIS section is responsible for the development, management, and coordination of the Natural Resources Geographic Information System (NRGIS). This includes development of geographically referenced databases; GIS system planning and integration with other computer systems; assistance to all DNR programs regarding GIS technology implementation; staff training on GIS concepts and using GIS tools; providing expertise and public access to GIS data; and external coordination with state, federal, and local government, as well as university and private groups regarding geospatial databases and GIS technology. The section also is responsible for acquisition of aerial photography, satellite imagery, geophysical data, topographic data, and special maps that may be required for various resource investigations.

Program accomplishments for 2010 include:

--Statewide LiDAR Completed and Available

Statewide LiDAR (Light Detection and Ranging) collection and distribution was completed in 2010. This is the culmination of a five-year, \$4.3 million dollar effort to collect highly accurate surface elevations for the state. Iowa's landscape is now mapped at 2-foot elevation intervals, while past mapping was at 10-to-20 foot intervals. This information produces significant savings for Iowa's businesses, communities, and agricultural interests, and government agencies. LiDAR represents a form of information that simply did not exist in the past, and its uses and value grow daily. The data are freely available to the public on a number of Iowa websites. Iowa is one of only six states that have statewide LiDAR available.



LiDAR view of the Loess Hills and Soldier River, showing major gully growth patterns.

--Floodplain Mapping

Following the devastating floods of 2008, the GIS program began an effort to create or update FEMA approved floodplain maps for the entire state. This project is economically possible because of the state's investment in LiDAR elevation data and is being funded by a \$15 million federal Community Development Block Grant. The University of Iowa's Iowa Flood Center is serving as the primary mapping contractor for the effort.

--Historic Aerial Photography

Aerial photos from the past capture the history of Iowa's natural landscape and human activities. What was this land used for in the past? Is there contamination? Has the drainage changed? What used to be here? These are common questions from those who own or want to develop Iowa's lands. In 2010, the GIS program completed

scanning, referencing, and stitching together statewide aerial photos for the 1930s, 50s, 60s and will complete the 1970s and 80s this year. When the 1980s are finished, we will have a seamless decadal view of the state from the 1930s through present. These data are freely available on most Iowa GIS websites.

--Sinkhole Hazard Mapping

Where limestone bedrock is found close to the land surface, the porous rock may allow for surface collapse to occur. This can result in property damage, drainage alteration, and the funneling of unfiltered and contaminated runoff into groundwater aquifers. Staff utilized LiDAR and historic photography to map locations where current and past sinkholes have occurred, allowing for these features to be better planned for, avoided, and mitigated. Over 18,000 sinkholes have been mapped in the most sinkhole-prone parts of the state, primarily northeast Iowa, with large areas still in process.

--Details of Iowa's Land Cover

Remote sensing specialists in the GIS program are conducting high-resolution land cover, which provides an incredibly detailed look into the status of our land use. Staff have mapped approximately 50% of the state and anticipate finishing this project within a year. The final product will be a one-meter resolution product based on multiple high resolution photography sources.

--Web-Based GIS Applications

The GIS program develops web-based mapping services for a variety of DNR's program areas. Several web services were built and tested during 2010, and most have now been implemented. Examples include the Iowa Water Web, and services for the Forestry, Source Water Protection, and Private Lands programs. A number of applications were also developed for the facility-based One-Stop database.

Watershed Monitoring and Assessment

What we do: The Watershed Monitoring and Assessment Section is responsible for the design, implementation, and management of Iowa's Ambient Water Monitoring Program. The purpose of the program is to develop and deliver consistent, unbiased information about the long-term condition of Iowa's surface and groundwater resources. Water quality is tracked on our streams, lakes, wetlands, and groundwater, assuring that changes and trends in water quality are identified, and allowing informed decisions for the management, protection, and development of our water resources. Water quality and watershed data are readily web available.

Program accomplishments for 2010 include:

--Impaired Waters Identification

Iowa's 2008 list of impaired waters, as required every two years by Section 303(d) of the federal Clean Water Act, was approved by U.S. EPA in August 2010. The U.S. EPA Region 7 transmittal letter dated August 4, 2010 from William Spratlin...

(Director, Region 7 Water, Wetlands, and Pesticides Division) to Wayne Gieselman (Director, Iowa DNR Environmental Protection Division) for Iowa's final/approved 2008 Section 303(d) list stated:

"I congratulate you and your staff for the completion of the list development and submission process. This process requires a significant amount of staff resources and involves a complex evaluation and assessment of water quality data. We look forward to working with IDNR on the development of the 2010 Section 303(d) List in the near future."

Iowa's 2010 list of impaired waters has been prepared and submitted to the Environmental Protection Commission and the public for review and comment. The list will likely be sent to EPA for approval by mid-2011.

--Project AWARE

In 2010, Project AWARE held its eighth annual event on the East and West Nishnabotna rivers in southwest Iowa. Project AWARE (**A Watershed Awareness River Expedition**) is the DNR's volunteer weeklong river cleanup. A total of 100 river miles were cleaned by 223 volunteers (ranging in age from 2 to 75), and a total of 9.3 tons of trash were removed (54% was recycled) from the rivers. Seventy-nine different sponsors



AWARE volunteers haul a refrigerator.

supported the event through either monetary or in-kind donations. Due to the accomplishments of Project AWARE and its volunteers and staff, the event was honored with the 2010 Soil and Water Conservation Society Merit Award. The Merit Award is given in recognition of an outstanding activity, product, or service by a group, business firm, corporation, or organization that promotes the conservation of soil, water, and related natural resources. This represented the second national award recognizing the accomplishments of Project AWARE.

--IOWATER

IOWATER is Iowa's volunteer water monitoring program. Since 2001, IOWATER has trained Iowans interested in our water quality, the status of aquatic life, and our outdoor environment. We provide a web-available database for volunteers to enter and view results. IOWATER has been a highly successful effort, training thousands of Iowans

of all ages and walks of life. To assure continued success, IOWATER staff surveyed volunteers and others for their opinions on the program. We completed a program redesign to respond to changing needs of volunteers and the state, increase communication, increase data usability, improve the focus of the program on watersheds, and increase opportunities for volunteers. The redesign effort restructured introductory workshops by separating the biological monitoring into a stand-alone 8-hour module. Hands-on activities were included to improve the learning experience for the volunteers, workshops were given a greater watershed focus, and approaches for re-certification of volunteers were developed. We intend that these and other ongoing improvements will make IOWATER a success for another decade.

--Lake Monitoring

The ambient lake monitoring program sampled 128 lakes during 2010. The lake monitoring program is a partnership between DNR's Watershed Monitoring and Assessment Program and Lake Restoration Program. The data were used in the past year to track the status and trends in water quality in Iowa's lakes, to track the success of watershed improvement projects and lake restoration activities, and to better manage our lakes. Also in 2010, seven years of historical lake quality data were transferred into the State's new water quality information database (AWQMS).

--Stream Monitoring

The ambient stream monitoring program sampled 82 stream locations for chemical and physical parameters during 2010. The stream monitoring program is conducted in partnership with the State Hygienic Laboratory to provide information on the status and trends of streams in Iowa and to report the condition of streams to citizens, decision makers, and resource managers. Stream monitoring data are currently being used to develop stream nutrient standards and to report on Iowa's Water Quality Index (IWQI). IWQI values are calculated monthly and are divided into categories of excellent, very good, fair, poor, and very poor. The IWQI results are posted on a Google map, which allows the user to see the current status of the stream as well as historical trends (<http://www.igsb.uiowa.edu/wqm/wqi/WqiMonthly.htm>).

Biological monitoring, including fish and benthic macroinvertebrate taxa identification, continued in 2010. The biomonitoring program focused on the development of an index of biotic integrity for small headwater streams in the north-central or Des Moines Lobe region of the State. Additionally, the wadeable stream reference network continued to be monitored at the rate of 20 sites per year. These reference sites are minimally impacted by human activity and provide information on the expected biological condition of streams in different ecoregions of the state. Monitoring of these sites may also provide information on the impact of climate change or changes in the hydrologic system through time.

--Wetland Monitoring

The wetland monitoring program finished the Iowa Wetland Action Plan in 2010 (IGWS Special Report #4 or <http://www.igsb.uiowa.edu/wqm/publications/WetlandActionPlan2010.pdf>). The

Wetland Action Plan provides a road map for improving intra-agency coordination on wetland restoration issues, focusing wetland restoration activities within a watershed context, and suggesting tools to increase efficiency of wetland restoration activities. One of the tools suggested in the Wetland Action Plan has already begun development. The Wetland GIS tool will be a web-based application that allows resource managers to view hydric soils and small depressions that would likely result in successful wetland restoration. Other activities included monitoring of Natural Resources Conservation Service Wetland Restoration Project (WRP) wetlands during 2010. This project is providing baseline information on the quality of restored wetlands compared to reference or minimally disturbed wetlands. Data from the WRP project will help resource managers better construct restored wetlands to their natural state.

--Beach Monitoring

The beach monitoring program tested 37 state-owned beaches and 35 city-, county-, and locally owned beaches in 2010. The Iowa beach monitoring program collects weekly data on *E. coli* concentrations at beaches and reports the status of the beach on the IGWS webpage. During the 10 years of the beach monitoring program, beach goers have come to rely on this information to make decisions on when and where to go for recreation. The IGWS also began working with the Iowa Department of Public Health to begin an algal toxin monitoring and health surveillance program. This program will be used to determine the relative health risk from contact with surface waters containing common algal toxins.